

CLAIMS

1. Laying apparatus for cables, lines, conductors or suchlike (16), comprising at least a hydraulic circuit (11) provided with a variable delivery feed pump (17) and with a motor (21) connected to said feed pump (17) and able to drive laying means (13) for said cables and suchlike (16), characterized in that said hydraulic circuit (11) comprises detection means (32, 33) able to detect the value of pressure of the oil inside said hydraulic circuit (11) and to compare it with a pre-determined pressure value, and valve means (35, 37) connected to said detection means (32, 33) and able to reduce the delivery of said feed pump (17) in the event that the pressure measured exceeds said pre-determined pressure value.
2. Apparatus as in claim 1, characterized in that said detection means and said valve means are of the electronic type and comprise respectively a sensor (32) associated with said hydraulic circuit (11) and connected to electronic processing means (33), and an electro-valve (35) governed by said electronic processing means (33) and able to be selectively driven to act on the command members (22) of said feed pump (17) in order to reduce the delivery thereof.
3. Apparatus as in claim 2, characterized in that said sensor (32) is able to detect an electric signal, such as tension, current or frequency, correlated to the pressure value of the oil in the hydraulic circuit (11), and said electronic processing means (33) are able to compare the value of said electric signal with a pre-determined value, in order to determine whether the pressure threshold has been exceeded or not.
4. Apparatus as in claim 1, characterized in that said detection means and said valve means are of the hydraulic

type and comprise at least a valve able to be selectively activated to act on the command members (22) of said feed pump (17) in order to vary the delivery thereof.

5 5. Apparatus as in any claim hereinbefore, characterized in that a pre-loading pump (40) is associated with said circuit (11) and is able to prevent phenomena of cavitation and sudden variations in pressure inside said circuit (11).

6. Apparatus as in any claim hereinbefore, characterized in that said feed pump (17) is of the reversible type, and is
10 connected to said motor (21) by means of two symmetrical pipes (19, 20), so that each of said two pipes (19, 20) is able to function either as delivery pipe or return pipe.

7. Apparatus as in claim 2 or 4, characterized in that said command member (22) is mechanically connected to a
15 hydraulic actuator (23) which is kept in an intermediate position of balance by counteracting elastic means (25, 26) arranged inside respective containing chambers (27, 29).

8. Apparatus as in claim 7, characterized in that at least one of said containing chambers (27, 29) is connected to
20 said valve means (35, 37), the activation of said valve means (35, 37) being able to determine the axial displacement of said hydraulic actuator (23) and invert the direction of pumping, or reduce the delivery, of the feed pump (17).

25 9. Apparatus as in claim 8, characterized in that said hydraulic piston (23) is also able to be displaced axially by means of a manual command (43) acting on a distributor valve (45) connected to said containing chambers (27, 29), said valve means (35, 37) being predominant with respect to
30 said distributor valve (45).

10. Apparatus as in any claim hereinbefore, characterized in that two limit valves (30, 31) are simmetrically located parallel to said pipes (19, 20) with a safety function,

able to make the oil pumped by the feed pump (17) recirculate when said motor (21) is subjected to excessive forces.

11. Laying method for cables, lines, conductors or suchlike (16), in an apparatus comprising at least a hydraulic circuit (11) provided with a variable delivery feed pump (17) and a motor (21) connected to said feed pump (17) in order to drive laying means (13) for said cables and suchlike (16), characterized in that it provides a first step wherein detection means (32, 33) detect the value of the pressure of the oil in said hydraulic circuit (11), a second step wherein comparison means compare said value detected with a pre-determined threshold value, and a third step wherein valve means (35, 37) are activated to act on said feed pump (17) so as to reduce the delivery thereof in the event that the pressure detected exceeds the pre-determined threshold value.

12. Laying machine for cables, lines, conductors or suchlike (16), provided with laying means (13) able to simultaneously lay a plurality of said cables and suchlike (16), characterized in that it comprises a plurality of laying apparatuses (10) as in any of the claims from 1 to 10 inclusive, correlated in number to that of said cables and suchlike (16) so as to be able to regulate in an independent, and possibly differentiated manner, the individual specific thresholds of intervention.